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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|-----------------------|------------------|
| 09/819,336 | 03/28/2001 | Daniel F. Graves | P96040US1A/FIR 2 0020 | 4242 |

7590 03/01/2004
Chief Intellectual Property Counsel
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EXAMINER

LU, C CAIXIA

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 1713 | |

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/819,336

Applicant(s)

GRAVES ET AL.

Examiner

Caixia Lu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 6-33 is/are pending in the application.
- 4a) Of the above claim(s) 8, 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6, 7, 9-10 and 21-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/14/04 & 2/19/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Request for Continued Examination

1. The request for continued examination (RCE) under 37 C.F.R. § 1.114 of Application No 09/819,336 filed on January 14, 2004 is acceptable. An action on the RCE follows.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 9 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The instant claims are dependent on canceled claim 5.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 31 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The concentration range of from 0.5 to 1 does not have direct support in specification. The disclosure of "up to more than 1" does not anticipate end point of "at 1".

Claim Rejections - 35 USC § 103

6. Claims 1-3, 6, 7, 9-10 and 21-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hudson (US 3,791,888) in view of Milkovich (US 4,417,029) and Carson (US 4,399,260).

The instant claims are directed to a process of manufacture of a baleable carboxylate terminated polymer comprising polymerizing at least one conjugated diene in the presence of an organolithium initiator to substantially completion and terminating the polymerization via addition of carbon dioxide.

Hudson teaches a process for the preparation of a polymer of a conjugated dienes by anionically polymerizing conjugated dienes such as butadiene and optional vinyl-substituted aromatic compounds such as styrene in the presence of organolithium initiator and polar compound of diethyl ether, and terminating the polymerization with excess amount of carbon dioxide (col. 3, lines 12-45 and Example 1) to provide a carboxylate terminated polymer. Hudson also teaches that semisolid and solid terminally reactive polymer can be prepared having molecular weight up to 150,000 or higher (col. 4, lines 32-36). A skilled artisan would have understood that a semisolid or a solid polymer would be baleable.

Although Hudson does not expressly teach the solution viscosity and bulk viscosity of the butadiene polymer, Hudson's semisolid and solid polymers have molecular weights of up to 150,000 or higher (col. 4, lines 32-34) encompassing the molecular weight range of the polymers of the instant claims and are made by processes using catalyst compositions which are substantially identical to those

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disclosed in the instant specification. Therefore, a skilled artisan would have expected Hudson's semisolid and solid polymers to inherently have solution viscosity and bulk viscosity which encompass those of the instant claims.

Once a product appearing to be substantially identical is found and a 35 USC 102/103 rejection made, the burden of proof is shifted to the applicant to show an unobvious difference. In re Fitzgerald, 205 USPQ 594. In re Fessmann, 180 USPQ 324. Applicants have not met their burden to demonstrate an unobvious difference between the claimed product and the products of the prior art examples.

Claims 21 further limits the process to include the addition of a polar compound such as tetramethylethylene diimine, and claim 30 further limits a vinyl modifier to a laundry list. While the indicated compounds are not in the cited prior art, they is generally known in the art, e.g., Carson (col. 6, line 45 to col. 7, line 5). Therefore, it would have been obvious to replace Hudson's vinyl modifier of diethyl ether with Carson's functionally equivalent vinyl modifier in the absence of any showing of criticality and unexpected results.

Claim 28 further limit the comonomer content in the polymer in the range of 5-30%. It is noted that Hudson does not expressly disclose the percentage of vinyl-substituted aromatic compounds. Incorporating vinyl-substituted aromatic compounds in butadiene polymer increases the mechanical strength but decreases elasticity of the butadiene polymer. Milkovich provides the guidance that the composition containing from 10 to 55 wt.% of vinyl-substituted aromatic compounds have properties of thermoplastic elastomers (col. 3, lines 20-25). Therefore, when the of vinyl-substituted

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aromatic compounds is introduced to Hudson's butadiene polymer, it would have been obvious to follow Milkovich's guidance to incorporate vinyl-substituted aromatic compounds to the butadiene polymer.

The limitations of all claims have been considered and are deemed to be within the purview of the prior art.

Response to Arguments

7. Applicant's arguments filed February 19, 2004 have been fully considered but they are not persuasive.

Contrary applicants' argument that "there is no indication that the polymers of Hudson would necessarily have the claimed viscosity", reasons were provided in the previous Office actions and repeated as shown above:

-- Although Hudson does not expressly teach the solution viscosity and bulk viscosity of the butadiene polymer, Hudson's semisolid and solid polymers have molecular weights of up to 150,000 or higher (col. 4, lines 32-34) encompassing the molecular weight range of the polymer of the instant claims and are made by processes using catalyst compositions which are substantially identical to those disclosed in the instant specification. Therefore, a skilled artisan would have expected Hudson's semisolid and solid polymers to inherently have solution viscosity and bulk viscosity which encompass those of the instant claims. --

Applicants are requested to shown that at least Hudson's polymers with molecular weight of 150,000 is different the polymers of the instant claims.

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Applicants also argue again that "there is no indication that the polymer disclosed in Hudson is a baleable polymer". The response to that were provided on pages 3-4 in the final Office action mailed July 11, 2003 and applicants have not yet identified any error in the examiner's previous response.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caixia Lu whose telephone number is (571) 272-1106. The examiner can normally be reached from 9:00 am to 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful and the matter is urgent, the examiner's supervisor, David Wu, can be reached at (571) 272-1114. The fax numbers for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-0994.



Caixia Lu, Ph. D.
Primary Examiner
Art Unit 1713
February 22, 2004